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Mark Yarkosky

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EXAMINER

AJIBADE AKONAI, OLUMIDE

ART UNIT

PAPER NUMBER

2617

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DELIVERY MODE

09/24/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/659,647

Applicant(s)

YARKOSKY, MARK

Examiner

Olumide T. Ajibade-Akonai

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 7,9-12,14,23,24 and 26-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7,9-12,14,23,24 and 26-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2617

### DETAILED ACTION


1. In view of the appeal brief filed on 23 April 2007 and 14 June 2007, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

  
Rafael Perez-Gutierrez  
Supervisory Patent Examiner  
Technology Center 2600  
Art Unit 2617  
9/17/07

### Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 7, 9, 12, 14, 23, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over **O 'Neill 6,993,287** in view of **Schmutz et al 6,748,212**.

Regarding **claim 7**, O 'Neill discloses a method for dynamically directing a wireless repeater (repeater system 20, see figs. 2-4, col. 8, lines 20-23), the method comprising: receiving wireless signals by directing an antenna (receive antenna 200, see figs. 3 and 4, col. 8, lines 46-47) to incrementally sweep its coverage area across a given area (pivot 202 to point the receive antenna 200 in different directions in order to select on of three signals from the three strong donor cells, see col. 10, lines 6-13), and to thereby receive wireless signals from a plurality of base stations (pivot 202 to point the receive antenna 200 in different directions in order to select on of three signals from the three strong donor cells, see col. 10, lines 6-13); the wireless repeater determining signal strength of the received wireless signals; and based on the signal strength, directing the wireless repeater to radiate amplified wireless signals at a given increment (downlink radio signals 110 from one to three donor cells 101 are transmitted to an antenna 400 of repeater system 20, and the directional receive antenna 20 selects a radio signal from the plurality of candidate donor cells, see col. 8, lines 41-49, col. 9,

Art Unit: 2617

lines 58-67), and based on the signal strength directing the wireless repeater to radiate amplified wireless signals at a given increment (transmitting amplified signal 110a to a subscriber unit, see col. 8, lines 41-49, col. 10, lines 14-59, col. 12, lines 5-12).

O'Neill discloses the use of the repeater to eliminate co-channel interference (see col. 6, lines 1-8) and further discloses selecting one of the downlink signals based on a signal quality metric such as signal strength for use with the subscriber units (see col. 8, lines 41-56). O'Neill, however, does not disclose explicitly disclose wherein the signal quality metric is carrier-to-cochannel interference. The examiner contends that this feature was well known in the art at the time the invention was made as taught by Schmutz.

In an analogous art Schmutz teaches the use of various signal metrics such including frame erasure rates FER, carrier-to-noise ratio C/N, and carrier-to-interference ratio C/I (see col. 8, lines 46-60) for mitigating adverse effects such as noise and interference.

It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Schmutz, by requiring the repeater to measure the downlink signal received from the base transceiver station(s), and determine the carrier-to-cochannel interference ratios of the signals, for the benefit of mitigating noise and interference in a wireless system.

Regarding **claim 23**, O'Neill discloses a wireless repeater (repeater system 20, see figs. 2-4, col. 8, lines 20-23) comprising: a donor antenna (receive antenna 200, see figs. 3 and 4, col. 8, lines 46-47) that is operable to communicate with a plurality of base

Art Unit: 2617

stations (candidate donor cells 101, see figure 3, col. 9, lines 58-60) and to receive wireless signals over a coverage area by incrementally sweeping across tile coverage area, thereby receiving wireless signals from a plurality of base stations (pivot 202 to point the receive antenna 200 in different directions in order to select on of three signals from the three strong donor cells, see col. 10, lines 6-13); receiving wireless signals from the donor antenna and identifying characteristics of the wireless signals received (pivot 202 to point the receive antenna 200 in different directions in order to receive three signals from the three strong donor cells, see col. 8, lines 41-56, col. 10, lines 6-13); and a processor operable to record in data storage the characteristics of the wireless signals received and, based on the characteristics, to direct the donor antenna to radiate amplified wireless signals at a given increment (downlink radio signals 110 from one to three donor cells 101 are transmitted to an antenna 400 of repeater system 20, and the directional receive antenna 20 selects a radio signal from the plurality of candidate donor cells, and transmitting amplified signal 110a to a subscriber unit, indicating that the repeater has a storage/memory means to store the signal strength metric received from each donor cell and processing means to compare the signal metric, see col. 8, lines 41-49, col. 9, lines 58-67, col. 10, lines 14-59, col. 12, lines 5-12).

O 'Neill teaches identifying/determining a characteristic of wireless signals received (pivot 202 to point the receive antenna 200 in different directions in order to receive three signals from the three strong donor cells, and based on a signal metric, selecting on of three signals, see col. 8, lines 41-56, col. 10, lines 6-13). O 'Neill

Art Unit: 2617

however does not explicitly disclose a wireless repeater comprising mobile station modem that receives wireless signals from the donor antenna and identifies characteristics of the wireless signals received. The examiner contends that this feature was well known in the art at the time the invention was made as taught by Schmutz.

In an analogous art Schmutz teaches a repeater comprising mobile station modem functionality (DSP processor 42A and 42B, see fig. 3, col. 5, lines 36-42, lines 43-45, col. 6, lines 23-25) that receives wireless signals from a donor antenna (repeater with a directional antenna 13 to communicate with a BTS, wherein signals received from the BTS are passed to the DSP, see fig. 3, col. 5, lines 52-55, col. 6, lines 10-28) and identifying a characteristic of the signal (see col. 5, lines 38-41, col. 6, lines 10-13).

It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Schmutz, by having a DSP to modulate and demodulate the wireless signals from a BTS, into the system of O'Neill for the benefit of decoding the received signal data from the wireless telephony format.

Regarding **claim 9**, as applied to claim 7, O'Neill further discloses wherein receiving the wireless signals by directing an antenna to incrementally sweep its coverage area across a given area comprises receiving the wireless signals from a plurality of directional antenna components, where each directional antenna component is operable to receive wireless signals from a given coverage area (pivot 202 to point the receive antenna 200 in different directions in order to select on of three signals from the three strong donor cells, see col. 10, lines 6-13).

Regarding **claim 12**, as applied to claim 7, O'Neill further discloses herein directing the wireless repeater to radiate amplified wireless signals at a given increment comprises directing the wireless repeater to radiate the amplified wireless signals at an increment corresponding to a strongest signal strength (transmitting amplified signal 110a to a subscriber unit, see col. 8, lines 41-49, col. 10, lines 14-59, col. 12, lines 5-12).

O'Neill discloses the use of the repeater to eliminate co-channel interference (see col. 6, lines 1-8) and further discloses selecting one of the downlink signals based on a signal quality metric such as signal strength for use with the subscriber units (see col. 8, lines 41-56). O'Neill, however, does not disclose explicitly disclose wherein the signal quality metric is carrier-to-cochannel interference. The examiner contends that this feature was well known in the art at the time the invention was made as taught by Schmutz.

In an analogous art Schmutz teaches the use of various signal metrics such including frame erasure rates FER, carrier-to-noise ratio C/N, and carrier-to-interference ratio C/I (see col. 8, lines 46-60) for mitigating adverse effects such as noise and interference.

It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Schmutz, by requiring the repeater to measure the downlink signal received from the base transceiver station(s), and determine the carrier-to-cochannel interference ratios of the signals, for the benefit of mitigating noise and interference in a wireless system.



Regarding **claim 14**, as applied to claim 7, O 'Neill further discloses radiating the amplified signals in a direction of a given sector of a base station (transmitting amplified signal 110a to a subscriber unit, see col. 8, lines 41-49, col. 10, lines 14-59, col. 12, lines 5-12).

Regarding **claim 30**, as applied to claim 23, O 'Neill further discloses wherein the donor antenna is an antenna selected from the group consisting of an omni-directional antenna, a directional antenna, and a phased array antenna (see figs. 2-4, col. 9, line 61).

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over **O 'Neill 6,993,287** in view of **Schmutz et al 6,748,212** as applied to claims 7 above, and further in view of **Lehmusto et al (5,907,794)**.

Regarding **claim 10**, as applied to claim 7, O'Neill, as modified by Schmutz discloses the claimed invention except further comprising for each of the received wireless signals, storing in data storage a coverage area identifier corresponding to a coverage area from which the wireless signals were received.

In the same field of endeavor, Lehmusto et al discloses further comprising for each of the received wireless signals, storing in data storage (database maintained at the repeater, see col. 3, lines 24-32) a coverage area identifier subscriber stations corresponding to a coverage area from which the wireless signals were received (identifiers of the subscriber stations which operate on mode channels within the coverage area of the repeater are stored in the database, see col. 3, lines 24-32).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Lehmusto et al into the system of O'Neill, as modified by Schmutz for the benefit of maintaining the information of subscribers in the coverage area in the repeater station.

4. Claims 11 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Neill 6,993,287 in view of Schmutz et al 6,748,212 as applied to claims 7 and 23 above, and further in view of Kuwahara et al (20030162550).

Regarding claim 11, as applied to claim 7, O'Neill, as modified by Schmutz discloses the claimed invention except further comprising determining a PN-offset of each received wireless signal.

In the same field of endeavor, Kuwahara et al discloses further comprising determining a PN-offset of each received wireless signal (base station 0 is a repeater that transmits pilot signals to the mobile terminal with a predetermined pilot PN offset, see p. 6, [0068]-[0069]).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Kuwahara et al into the system of O'Neill, as modified by Schmutz for the benefit of providing a means for a wireless communications terminal to detect repeaters.

Regarding claim 24, as applied to claim 23, O'Neill, as modified by Schmutz disclose the claimed invention.

O'Neill, as modified by Schmutz fail to disclose wherein the characteristics

Art Unit: 2617

are selected from the group consisting of PN-offsets of the wireless signals and signal to noise ratios  $E_c/I_o$  for each PN offset.

In the same field of endeavor, Kuwahara et al discloses wherein the characteristics are selected from the group consisting of PN-offsets of the wireless signals (base station 0 is a repeater that transmits pilot signals to the mobile terminal with a predetermined pilot PN offset, see p. 6, [0068]-[0069]) and signal to noise ratios  $E_c/I_o$  for each PN offset.

It would therefore have been obvious to one of ordinary skill in the art to further modify the combination of O'Neill, as modified by Schmutz and Kuwahara for the benefit of determining whether a repeater or base station from which the terminal receives signals by observing the number of sectors it receives.

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Neill 6,993,287 in view of Schmutz et al 6,748,212 as applied to claim 23 above, and further in view of Kita (5,534,872).

Regarding claim 26, as applied to claim 23, O'Neill, as modified by Schmutz discloses the claimed invention except wherein at each increment, the donor antenna receives wireless signals and passes the wireless signals to the processor which records in the data storage the increment at which each wireless signal was received.

Kita, however, teaches wherein at each increment (distance measurement in correspondence with every ten degrees with respect to one rotation angle, see col. 4, lines 64-67), the donor antenna (antenna 1, see fig. 1, col. 3, line 57) receives wireless signals (electromagnetic waves received by antenna 1 when the antenna has been

Art Unit: 2617

rotated by an angle, see col. 5, lines 34-42) and passes the wireless signals to the processor which records in the data storage (memory circuit 16, see fig. 1, col. 4, line 56) the increment at which each wireless signal was received (angle data is stored in memory circuit 16, and the angle data is derived from the rotation of the antenna to receive radio signals reflected from a target, see abstract, col. 4, lines 4-11 and lines 58-63).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Kita into the system of O'Neill, as modified by Schmutz for the benefit of measuring the distance for transmitting a radio signal every time the antenna is rotated by a rotation angle.

6. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over **O 'Neill 6,993,287** in view of **Schmutz et al 6,748,212** as applied to claim 23 above, and further in view of **Matsuda 20020072357**.

Regarding **claim 31**, as applied to claim 23, O 'Neill discloses, wherein the processor records the phase of the antenna at which each wireless signal is received, and based on the characteristics of the wireless signals, directs the antenna to radiate the amplified wireless signals at a given phase (downlink radio signals 110 from one to three donor cells 101 are transmitted to an antenna 400 of repeater system 20, and the directional receive antenna 20 selects a radio signal from the plurality of candidate donor cells, and transmitting amplified signal 110a to a subscriber unit, indicating that the repeater has a storage/memory means to store the signal strength metric received from each donor cell and processing means to compare the signal metric, see col. 8,

Art Unit: 2617

lines 41-49, col. 9, lines 58-67, col. 10, lines 14-59, col. 12, lines 5-12). O'Neill, as modified by Schmutz fails to disclose wherein the donor antenna is a phased array antenna. The examiner contends that this feature was well known in the art at the time the invention was made as taught by Matsuda.

In an analogous art, Matsuda discloses a wireless repeater (see fig. 17, p.9, [0014]) wherein the donor antenna is a phased array antenna (receiving antenna uses a phased array antenna, see fig. 17, p.9, [0114]).

It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Matsuda, by having a wireless repeater with a phased array antenna for the benefit of controlling the directivity of the antenna so as to received maximum signal intensity during a wireless connection.

7. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over **O'Neill 6,993,287** in view of **Schmutz et al 6,748,212** and **Kita (5,534,872)** as applied to claim 26 above, and further in view of **Wang et al (6,799,024)**.

Regarding **claim 27**, as applied to claim 26, O'Neill, as modified by Schmutz and Kita disclose the claimed invention except wherein the mobile station modem is a rake receiver that identifies the PN-offset in the wireless signals.

In the same field of endeavor, Wang et al teaches wherein the mobile station modem is a rake receiver (RAKE receiver, see col. 4, line 41) that identifies the PN-offset in the wireless signals (information bearing signal comprises a spreading code with a pseudo-random noise sequence that is identifiable by a rake receiver, see col. 4, lines 33-42).

Art Unit: 2617

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Wang et al into the system of O'Neill, as modified by Schmutz and Kita for the benefit of demodulating coded signals from the mobile station.

8. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over O 'Neill 6,993,287 in view of Schmutz et al 6,748,212 and Kita (5,534,872) and Wang et al (6,799,024) claim 27 above, and further in view of Tak et al (6,567,460).

Regarding **claim 28**, as applied to claim 27, O'Neill, as modified by Schmutz and Kita and Wang et al disclose the claimed invention except wherein the processor records in the data storage the PN offsets and the signal to noise ratios of the wireless signals at each increment.

In the same field of endeavor, Tak et al teaches wherein the processor (controlling part 260, see fig. 2, col. 5, line 23) records in the data storage (storage area, see col. 5, line 28) the PN offsets (pilot PN offset, see col. 5, lines 33-35) and the signal to noise ratios of the wireless signals at each increment (database stores the PN offset and power information, see col. 5, lines 25-29).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Tak et al into the system of O'Neill, as modified by Schmutz and Kita for the benefit of detecting the pilot PN offsets in a telephone system.

Regarding **claim 29**, as applied to claim 28, the combination of O 'Neill further discloses wherein the processor instructs the donor antenna to radiate the amplified wireless signals to a base station that corresponds to an increment where the mobile station modem detected a highest signal-to-noise ratio (downlink radio signals 110 from

one to three donor cells 101 are transmitted to an antenna 400 of repeater system 20, and the directional receive antenna 20 selects a radio signal from the plurality of candidate donor cells, and transmitting amplified signal 110a to a subscriber unit, indicating that the repeater has a storage/memory means to store the signal strength metric received from each donor cell and processing means to compare the signal metric, see col. 8, lines 41-49, col. 9, lines 58-67, col. 10, lines 14-59, col. 12, lines 5-12).

### ***Claim Objections***

9. Claim 15 is objected to because of the following informalities: Claim 15 should be canceled as indicated in the page of remarks filed 20 April 2007 Appropriate correction is required.

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olumide T. Ajibade-Akonai whose telephone number is 571-272-6496. The examiner can normally be reached on M-F, 8.30p-5p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael Perez-Gutierrez can be reached on 571-272-7915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2617

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

OA

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9/17/07